

Sequence Listing PatentIn-file BP202624.ST25 (ID 771711)
SEQUENCE LISTING

<110> University of Oulu
<120> Process for producing natively folded disulfide bond containing proteins in a prokaryotic host
<130> BP202624
<160> 11
<170> PatentIn version 3.3
<210> 1
<211> 563
<212> PRT
<213> *Saccharomyces cerevisiae*

<400> 1

Met Arg Leu Arg Thr Ala Ile Ala Thr Leu Cys Leu Thr Ala Phe Thr
1 5 10 15

Ser Ala Thr Ser Asn Asn Ser Tyr Ile Ala Thr Asp Gln Thr Gln Asn
20 25 30

Ala Phe Asn Asp Thr His Phe Cys Lys Val Asp Arg Asn Asp His Val
35 40 45

Ser Pro Ser Cys Asn Val Thr Phe Asn Glu Leu Asn Ala Ile Asn Glu
50 55 60

Asn Ile Arg Asp Asp Leu Ser Ala Leu Leu Lys Ser Asp Phe Phe Lys
65 70 75 80

Tyr Phe Arg Leu Asp Leu Tyr Lys Gln Cys Ser Phe Trp Asp Ala Asn
85 90 95

Asp Gly Leu Cys Leu Asn Arg Ala Cys Ser Val Asp Val Val Glu Asp
100 105 110

Trp Asp Thr Leu Pro Glu Tyr Trp Gln Pro Glu Ile Leu Gly Ser Phe
115 120 125

Asn Asn Asp Thr Met Lys Glu Ala Asp Asp Ser Asp Asp Glu Cys Lys
130 135 140

Phe Leu Asp Gln Leu Cys Gln Thr Ser Lys Lys Pro Val Asp Ile Glu
145 150 155 160

Asp Thr Ile Asn Tyr Cys Asp Val Asn Asp Phe Asn Gly Lys Asn Ala
165 170 175

Val Leu Ile Asp Leu Thr Ala Asn Pro Glu Arg Phe Thr Gly Tyr Gly
180 185 190

Sequence Listing PatentIn-file BP202624. ST25 (ID 771711)

Gly Lys Gln Ala Gly Gln Ile Trp Ser Thr Ile Tyr Gln Asp Asn Cys
195 200 205

Phe Thr Ile Gly Glu Thr Gly Glu Ser Leu Ala Lys Asp Ala Phe Tyr
210 215 220

Arg Leu Val Ser Gly Phe His Ala Ser Ile Gly Thr His Leu Ser Lys
225 230 235 240

Glu Tyr Leu Asn Thr Lys Thr Gly Lys Trp Glu Pro Asn Leu Asp Leu
245 250 255

Phe Met Ala Arg Ile Gly Asn Phe Pro Asp Arg Val Thr Asn Met Tyr
260 265 270

Phe Asn Tyr Ala Val Val Ala Lys Ala Leu Trp Lys Ile Gln Pro Tyr
275 280 285

Leu Pro Glu Phe Ser Phe Cys Asp Leu Val Asn Lys Glu Ile Lys Asn
290 295 300

Lys Met Asp Asn Val Ile Ser Gln Leu Asp Thr Lys Ile Phe Asn Glu
305 310 315 320

Asp Leu Val Phe Ala Asn Asp Leu Ser Leu Thr Leu Lys Asp Glu Phe
325 330 335

Arg Ser Arg Phe Lys Asn Val Thr Lys Ile Met Asp Cys Val Gln Cys
340 345 350

Asp Arg Cys Arg Leu Trp Gly Lys Ile Gln Thr Thr Gly Tyr Ala Thr
355 360 365

Ala Leu Lys Ile Leu Phe Glu Ile Asn Asp Ala Asp Glu Phe Thr Lys
370 375 380

Gln His Ile Val Gly Lys Leu Thr Lys Tyr Glu Leu Ile Ala Leu Leu
385 390 395 400

Gln Thr Phe Gly Arg Leu Ser Glu Ser Ile Glu Ser Val Asn Met Phe
405 410 415

Glu Lys Met Tyr Gly Lys Arg Leu Asn Gly Ser Glu Asn Arg Leu Ser
420 425 430

Ser Phe Phe Gln Asn Asn Phe Phe Asn Ile Leu Lys Glu Ala Gly Lys
435 440 445

Ser Ile Arg Tyr Thr Ile Glu Asn Ile Asn Ser Thr Lys Glu Gly Lys
450 455 460

Sequence Listing PatentIn-file BP202624.ST25 (ID 771711)

Lys Lys Thr Asn Asn Ser Gln Ser His Val Phe Asp Asp Leu Lys Met
465 470 475 480

Pro Lys Ala Glu Ile Val Pro Arg Pro Ser Asn Gly Thr Val Asn Lys
485 490 495

Trp Lys Lys Ala Trp Asn Thr Glu Val Asn Asn Val Leu Glu Ala Phe
500 505 510

Arg Phe Ile Tyr Arg Ser Tyr Leu Asp Leu Pro Arg Asn Ile Trp Glu
515 520 525

Leu Ser Leu Met Lys Val Tyr Lys Phe Trp Asn Lys Phe Ile Gly Val
530 535 540

Ala Asp Tyr Val Ser Glu Glu Thr Arg Glu Pro Ile Ser Tyr Lys Leu
545 550 555 560

Asp Ile Gln

<210> 2
<211> 468
<212> PRT
<213> Homo sapiens

<400> 2

Met Gly Arg Gly Trp Gly Phe Leu Phe Gly Leu Leu Gly Ala Val Trp
1 5 10 15

Leu Leu Ser Ser Gly His Gly Glu Glu Gln Pro Pro Glu Thr Ala Ala
20 25 30

Gln Arg Cys Phe Cys Gln Val Ser Gly Tyr Leu Asp Asp Cys Thr Cys
35 40 45

Asp Val Glu Thr Ile Asp Arg Phe Asn Asn Tyr Arg Leu Phe Pro Arg
50 55 60

Leu Gln Lys Leu Leu Glu Ser Asp Tyr Phe Arg Tyr Tyr Lys Val Asn
65 70 75 80

Leu Lys Arg Pro Cys Pro Phe Trp Asn Asp Ile Ser Gln Cys Gly Arg
85 90 95

Arg Asp Cys Ala Val Lys Pro Cys Gln Ser Asp Glu Val Pro Asp Gly
100 105 110

Ile Lys Ser Ala Ser Tyr Lys Tyr Ser Glu Glu Ala Asn Asn Leu Ile
115 120 125

Glu Glu Cys Glu Gln Ala Glu Arg Leu Gly Ala Val Asp Glu Ser Leu
Si vu 3

Sequence Listing PatentIn-file BP202624.ST25 (ID 771711)

130

135

140

Ser Glu Glu Thr Gln Lys Ala Val Leu Gln Trp Thr Lys His Asp Asp
145 150 155 160

Ser Ser Asp Asn Phe Cys Glu Ala Asp Asp Ile Gln Ser Pro Glu Ala
165 170 175

Glu Tyr Val Asp Leu Leu Leu Asn Pro Glu Arg Tyr Thr Gly Tyr Lys
180 185 190

Gly Pro Asp Ala Trp Lys Ile Trp Asn Val Ile Tyr Glu Glu Asn Cys
195 200 205

Phe Lys Pro Gln Thr Ile Lys Arg Pro Leu Asn Pro Leu Ala Ser Gly
210 215 220

Gln Gly Thr Ser Glu Glu Asn Thr Phe Tyr Ser Trp Leu Glu Gly Leu
225 230 235 240

Cys Val Glu Lys Arg Ala Phe Tyr Arg Leu Ile Ser Gly Leu His Ala
245 250 255

Ser Ile Asn Val His Leu Ser Ala Arg Tyr Leu Leu Gln Glu Thr Trp
260 265 270

Leu Glu Lys Lys Trp Gly His Asn Ile Thr Glu Phe Gln Gln Arg Phe
275 280 285

Asp Gly Ile Leu Thr Glu Gly Glu Gly Pro Arg Arg Leu Lys Asn Leu
290 295 300

Tyr Phe Leu Tyr Leu Ile Glu Leu Arg Ala Leu Ser Lys Val Leu Pro
305 310 315 320

Phe Phe Glu Arg Pro Asp Phe Gln Leu Phe Thr Gly Asn Lys Ile Gln
325 330 335

Asp Glu Glu Asn Lys Met Leu Leu Leu Glu Ile Leu His Glu Ile Lys
340 345 350

Ser Phe Pro Leu His Phe Asp Glu Asn Ser Phe Phe Ala Gly Asp Lys
355 360 365

Lys Glu Ala His Lys Leu Lys Glu Asp Phe Arg Leu His Phe Arg Asn
370 375 380

Ile Ser Arg Ile Met Asp Cys Val Gly Cys Phe Lys Cys Arg Leu Trp
385 390 395 400

Gly Lys Leu Gln Thr Gln Gly Leu Gly Thr Ala Leu Lys Ile Leu Phe
Si vu 4

Ser Glu Lys Leu Ile Ala Asn Met Pro Glu Ser Gly Pro Ser Tyr Glu
420 425 430

Phe His Leu Thr Arg Gln Glu Ile Val Ser Leu Phe Asn Ala Phe Gly
435 440 445

Arg Ile Ser Thr Ser Val Lys Glu Leu Glu Asn Phe Arg Asn Leu Leu
450 455 460

Gln Asn Ile His
465

<210> 3
<211> 467
<212> PRT
<213> Homo sapiens

<400> 3

Met Ser Gln Gly Val Arg Arg Ala Gly Ala Gly Gln Gly Val Ala Ala
1 5 10 15

Ala Val Gln Leu Leu Val Thr Leu Ser Phe Leu Arg Ser Val Val Glu
20 25 30

Ala Gln Val Thr Gly Val Leu Asp Asp Cys Leu Cys Asp Ile Asp Ser
35 40 45

Ile Asp Asn Phe Asn Thr Tyr Lys Ile Phe Pro Lys Ile Lys Lys Leu
50 55 60

Gln Glu Arg Asp Tyr Phe Arg Tyr Tyr Lys Val Asn Leu Lys Arg Pro
65 70 75 80

Cys Pro Phe Trp Ala Glu Asp Gly His Cys Ser Ile Lys Asp Cys His
85 90 95

Val Glu Pro Cys Pro Glu Ser Lys Ile Pro Val Gly Ile Lys Ala Gly
100 105 110

His Ser Asn Lys Tyr Leu Lys Met Ala Asn Asn Thr Lys Glu Leu Glu
115 120 125

Asp Cys Glu Gln Ala Asn Lys Leu Gly Ala Ile Asn Ser Thr Leu Ser
130 135 140

Asn Gln Ser Lys Glu Ala Phe Ile Asp Trp Ala Arg Tyr Asp Asp Ser
145 150 155 160

Arg Asp His Phe Cys Glu Leu Asp Asp Glu Arg Ser Pro Ala Ala Gln
165 170 175

Sequence Listing PatentIn-file BP202624.ST25 (ID 771711)

Tyr Val Asp Leu Leu Leu Asn Pro Glu Arg Tyr Thr Gly Tyr Lys Gly
 180 185 190
 Thr Ser Ala Trp Arg Val Trp Asn Ser Ile Tyr Glu Glu Asn Cys Phe
 195 200 205
 Lys Pro Arg Ser Val Tyr Arg Pro Leu Asn Pro Leu Ala Pro Ser Arg
 210 215 220
 Gly Glu Asp Asp Gly Glu Ser Phe Tyr Thr Trp Leu Glu Gly Leu Cys
 225 230 235 240
 Leu Glu Lys Arg Val Phe Tyr Lys Leu Ile Ser Gly Leu His Ala Ser
 245 250 255
 Ile Asn Leu His Leu Cys Ala Asn Tyr Leu Leu Glu Glu Thr Trp Gly
 260 265 270
 Lys Pro Ser Trp Gly Pro Asn Ile Lys Glu Phe Lys His Arg Phe Asp
 275 280 285
 Pro Val Glu Thr Lys Gly Glu Gly Pro Arg Arg Leu Lys Asn Leu Tyr
 290 295 300
 Phe Leu Tyr Leu Ile Glu Leu Arg Ala Leu Ser Lys Val Ala Pro Tyr
 305 310 315 320
 Phe Glu Arg Ser Ile Val Asp Leu Tyr Thr Gly Asn Ala Glu Glu Asp
 325 330 335
 Ala Asp Thr Lys Thr Leu Leu Leu Asn Ile Phe Gln Asp Thr Lys Ser
 340 345 350
 Phe Pro Met His Phe Asp Glu Lys Ser Met Phe Ala Gly Asp Lys Lys
 355 360 365
 Gly Ala Lys Ser Leu Lys Glu Glu Phe Arg Leu His Phe Lys Asn Ile
 370 375 380
 Ser Arg Ile Met Asp Cys Val Gly Cys Asp Lys Cys Arg Leu Trp Gly
 385 390 395 400
 Lys Leu Gln Thr Gln Gly Leu Gly Thr Ala Leu Lys Ile Leu Phe Ser
 405 410 415
 Glu Lys Glu Ile Gln Lys Leu Pro Glu Asn Ser Pro Ser Lys Gly Phe
 420 425 430
 Gln Leu Thr Arg Gln Glu Ile Val Ala Leu Leu Asn Ala Phe Gly Arg
 435 440 445

Sequence Listing PatentIn-file BP202624.ST25 (ID 771711)

Leu Ser Thr Ser Ile Arg Asp Leu Gln Asn Phe Lys Val Leu Leu Gln
450 455 460

His Ser Arg
465

<210> 4
<211> 205
<212> PRT
<213> Homo sapiens
<400> 4

Met Ala Ala Pro Gly Glu Arg Gly Arg Phe His Gly Gly Asn Leu Phe
1 5 10 15

Phe Leu Pro Gly Gly Ala Arg Ser Glu Met Met Asp Asp Leu Ala Thr
20 25 30

Asp Ala Arg Gly Arg Gly Ala Gly Arg Arg Asp Ala Ala Ala Ser Ala
35 40 45

Ser Thr Pro Ala Gln Ala Pro Thr Ser Asp Ser Pro Val Ala Glu Asp
50 55 60

Ala Ser Arg Arg Arg Pro Cys Arg Ala Cys Val Asp Phe Lys Thr Trp
65 70 75 80

Met Arg Thr Gln Gln Lys Arg Asp Thr Lys Phe Arg Glu Asp Cys Pro
85 90 95

Pro Asp Arg Glu Glu Leu Gly Arg His Ser Trp Ala Val Leu His Thr
100 105 110

Leu Ala Ala Tyr Tyr Pro Asp Leu Pro Thr Pro Glu Gln Gln Gln Asp
115 120 125

Met Ala Gln Phe Ile His Leu Phe Ser Lys Phe Tyr Pro Cys Glu Glu
130 135 140

Cys Ala Glu Asp Leu Arg Lys Arg Leu Cys Arg Asn His Pro Asp Thr
145 150 155 160

Arg Thr Arg Ala Cys Phe Thr Gln Trp Leu Cys His Leu His Asn Glu
165 170 175

Val Asn Arg Lys Leu Gly Lys Pro Asp Phe Asp Cys Ser Lys Val Asp
180 185 190

Glu Arg Trp Arg Asp Gly Trp Lys Asp Gly Ser Cys Asp
195 200 205

Sequence Listing PatentIn-file BP202624.ST25 (ID 771711)

<210> 5
 <211> 189
 <212> PRT
 <213> Saccharomyces cerevisiae

<400> 5

Met Lys Ala Ile Asp Lys Met Thr Asp Asn Pro Pro Gln Glu Gly Leu
 1 5 10 15

Ser Gly Arg Lys Ile Ile Tyr Asp Glu Asp Gly Lys Pro Cys Arg Ser
 20 25 30

Cys Asn Thr Leu Leu Asp Phe Gln Tyr Val Thr Gly Lys Ile Ser Asn
 35 40 45

Gly Leu Lys Asn Leu Ser Ser Asn Gly Lys Leu Ala Gly Thr Gly Ala
 50 55 60

Leu Thr Gly Glu Ala Ser Glu Leu Met Pro Gly Ser Arg Thr Tyr Arg
 65 70 75 80

Lys Val Asp Pro Pro Asp Val Glu Gln Leu Gly Arg Ser Ser Trp Thr
 85 90 95

Leu Leu His Ser Val Ala Ala Ser Tyr Pro Ala Gln Pro Thr Asp Gln
 100 105 110

Gln Lys Gly Glu Met Lys Gln Phe Leu Asn Ile Phe Ser His Ile Tyr
 115 120 125

Pro Cys Asn Trp Cys Ala Lys Asp Phe Glu Lys Tyr Ile Arg Glu Asn
 130 135 140

Ala Pro Gln Val Glu Ser Arg Glu Glu Leu Gly Arg Trp Met Cys Glu
 145 150 155 160

Ala His Asn Lys Val Asn Lys Lys Leu Arg Lys Pro Lys Phe Asp Cys
 165 170 175

Asn Phe Trp Glu Lys Arg Trp Lys Asp Gly Trp Asp Glu
 180 185

<210> 6
 <211> 196
 <212> PRT
 <213> Saccharomyces cerevisiae

<400> 6

Met Lys Gln Ile Val Lys Arg Ser His Ala Ile Arg Ile Val Ala Ala
 1 5 10 15

Leu Gly Ile Ile Gly Leu Trp Met Phe Phe Ser Ser Asn Glu Leu Ser
 Si vu 8

Ile Ala Thr Pro Gly Leu Ile Lys Ala Lys Ser Gly Ile Asp Glu Val
35 40 45

Gln Gly Ala Ala Ala Glu Lys Asn Asp Ala Arg Leu Lys Glu Ile Glu
50 55 60

Lys Gln Thr Ile Met Pro Leu Met Gly Asp Asp Lys Val Lys Lys Glu
65 70 75 80

Val Gly Arg Ala Ser Trp Lys Tyr Phe His Thr Leu Leu Ala Arg Phe
85 90 95

Pro Asp Glu Pro Thr Pro Glu Glu Arg Glu Lys Leu His Thr Phe Ile
100 105 110

Gly Leu Tyr Ala Glu Leu Tyr Pro Cys Gly Glu Cys Ser Tyr His Phe
115 120 125

Val Lys Leu Ile Glu Lys Tyr Pro Val Gln Thr Ser Ser Arg Thr Ala
130 135 140

Ala Ala Met Trp Gly Cys His Ile His Asn Lys Val Asn Glu Tyr Leu
145 150 155 160

Lys Lys Asp Ile Tyr Asp Cys Ala Thr Ile Leu Glu Asp Tyr Asp Cys
165 170 175

Gly Cys Ser Asp Ser Asp Gly Lys Arg Val Ser Leu Glu Lys Glu Ala
180 185 190

Lys Gln His Gly
195

<210> 7
<211> 747
<212> PRT
<213> Homo sapiens
<400> 7

Met Arg Arg Cys Asn Ser Gly Ser Gly Pro Pro Pro Ser Leu Leu Leu
1 5 10 15

Leu Leu Leu Trp Leu Leu Ala Val Pro Gly Ala Asn Ala Ala Pro Arg
20 25 30

Ser Ala Leu Tyr Ser Pro Ser Asp Pro Leu Thr Leu Leu Gln Ala Asp
35 40 45

Thr Val Arg Gly Ala Val Leu Gly Ser Arg Ser Ala Trp Ala Val Glu
50 55 60

Sequence Listing PatentIn-file BP202624.ST25 (ID 771711)

Phe Phe Ala Ser Trp Cys Gly His Cys Ile Ala Phe Ala Pro Thr Trp
65 70 75 80

Lys Ala Leu Ala Glu Asp Val Lys Ala Trp Arg Pro Ala Leu Tyr Leu
85 90 95

Ala Ala Leu Asp Cys Ala Glu Glu Thr Asn Ser Ala Val Cys Arg Asp
100 105 110

Phe Asn Ile Pro Gly Phe Pro Thr Val Arg Phe Phe Lys Ala Phe Thr
115 120 125

Lys Asn Gly Ser Gly Ala Val Phe Pro Val Ala Gly Ala Asp Val Gln
130 135 140

Thr Leu Arg Glu Arg Leu Ile Asp Ala Leu Glu Ser His His Asp Thr
145 150 155 160

Trp Pro Pro Ala Cys Pro Pro Leu Glu Pro Ala Lys Leu Glu Glu Ile
165 170 175

Asp Gly Phe Phe Ala Arg Asn Asn Glu Glu Tyr Leu Ala Leu Ile Phe
180 185 190

Glu Lys Gly Gly Ser Tyr Leu Gly Arg Glu Val Ala Leu Asp Leu Ser
195 200 205

Gln His Lys Gly Val Ala Val Arg Arg Val Leu Asn Thr Glu Ala Asn
210 215 220

Val Val Arg Lys Phe Gly Val Thr Asp Phe Pro Ser Cys Tyr Leu Leu
225 230 235 240

Phe Arg Asn Gly Ser Val Ser Arg Val Pro Val Leu Met Glu Ser Arg
245 250 255

Ser Phe Tyr Thr Ala Tyr Leu Gln Arg Leu Ser Gly Leu Thr Arg Glu
260 265 270

Ala Ala Gln Thr Thr Val Ala Pro Thr Thr Ala Asn Lys Ile Ala Pro
275 280 285

Thr Val Trp Lys Leu Ala Asp Arg Ser Lys Ile Tyr Met Ala Asp Leu
290 295 300

Glu Ser Ala Leu His Tyr Ile Leu Arg Ile Glu Val Gly Arg Phe Pro
305 310 315 320

Val Leu Glu Gly Gln Arg Leu Val Ala Leu Lys Lys Phe Val Ala Val
325 330 335

Sequence Listing PatentIn-file BP202624.ST25 (ID 771711)

Leu Ala Lys Tyr Phe Pro Gly Arg Pro Leu Val Gln Asn Phe Leu His
340 345 350

Ser Val Asn Glu Trp Leu Lys Arg Gln Lys Arg Asn Lys Ile Pro Tyr
355 360 365

Ser Phe Phe Lys Thr Ala Leu Asp Asp Arg Lys Glu Gly Ala Val Leu
370 375 380

Ala Lys Lys Val Asn Trp Ile Gly Cys Gln Gly Ser Glu Pro His Phe
385 390 395 400

Arg Gly Phe Pro Cys Ser Leu Trp Val Leu Phe His Phe Leu Thr Val
405 410 415

Gln Ala Ala Arg Gln Asn Val Asp His Ser Gln Glu Ala Ala Lys Ala
420 425 430

Lys Glu Val Leu Pro Ala Ile Arg Gly Tyr Val His Tyr Phe Phe Gly
435 440 445

Cys Arg Asp Cys Ala Ser His Phe Glu Gln Met Ala Ala Ala Ser Met
450 455 460

His Arg Val Gly Ser Pro Asn Ala Ala Val Leu Trp Leu Trp Ser Ser
465 470 475 480

His Asn Arg Val Asn Ala Arg Leu Ala Gly Ala Pro Ser Glu Asp Pro
485 490 495

Gln Phe Pro Lys Val Gln Trp Pro Pro Arg Glu Leu Cys Ser Ala Cys
500 505 510

His Asn Glu Arg Leu Asp Val Pro Val Trp Asp Val Glu Ala Thr Leu
515 520 525

Asn Phe Leu Lys Ala His Phe Ser Pro Ser Asn Ile Ile Leu Asp Phe
530 535 540

Pro Ala Ala Gly Ser Ala Ala Arg Arg Asp Val Gln Asn Val Ala Ala
545 550 555 560

Ala Pro Glu Leu Ala Met Gly Ala Leu Glu Leu Glu Ser Arg Asn Ser
565 570 575

Thr Leu Asp Pro Gly Lys Pro Glu Met Met Lys Ser Pro Thr Asn Thr
580 585 590

Thr Pro His Val Pro Ala Glu Gly Pro Glu Ala Ser Arg Pro Pro Lys
595 600 605

Sequence Listing PatentIn-file BP202624.ST25 (ID 771711)

Leu His Pro Gly Leu Arg Ala Ala Pro Gly Gln Glu Pro Pro Glu His
610 615 620

Met Ala Glu Leu Gln Arg Asn Glu Gln Glu Gln Pro Leu Gly Gln Trp
625 630 635 640

His Leu Ser Lys Arg Asp Thr Gly Ala Ala Leu Leu Ala Glu Ser Arg
645 650 655

Ala Glu Lys Asn Arg Leu Trp Gly Pro Leu Glu Val Arg Arg Val Gly
660 665 670

Arg Ser Ser Lys Gln Leu Val Asp Ile Pro Glu Gly Gln Leu Glu Ala
675 680 685

Arg Ala Gly Arg Gly Arg Gly Gln Trp Leu Gln Val Leu Gly Gly Gly
690 695 700

Phe Ser Tyr Leu Asp Ile Ser Leu Cys Val Gly Leu Tyr Ser Leu Ser
705 710 715 720

Phe Met Gly Leu Leu Ala Met Tyr Thr Tyr Phe Gln Ala Lys Ile Arg
725 730 735

Ala Leu Lys Gly His Ala Gly His Pro Ala Ala
740 745

<210> 8
<211> 698
<212> PRT
<213> Homo sapiens

<400> 8

Met Ala Ala Ala Gly Ala Ala Val Ala Arg Ser Pro Gly Ile Gly Ala
1 5 10 15

Gly Pro Ala Leu Arg Ala Arg Arg Ser Pro Pro Pro Arg Ala Ala Arg
20 25 30

Leu Pro Arg Leu Leu Val Leu Leu Ala Ala Ala Ala Val Gly Pro Gly
35 40 45

Ala Gly Gly Ala Ala Arg Leu Tyr Arg Ala Gly Glu Asp Ala Val Trp
50 55 60

Val Leu Asp Ser Gly Ser Val Arg Gly Ala Thr Ala Asn Ser Ser Ala
65 70 75 80

Ala Trp Leu Val Gln Phe Tyr Ser Ser Trp Cys Gly His Cys Ile Gly
85 90 95

Sequence Listing PatentIn-file BP202624.ST25 (ID 771711)

Tyr Ala Pro Thr Trp Arg Ala Leu Ala Gly Asp Val Arg Asp Trp Ala
 100 105 110
 Ser Ala Ile Arg Val Ala Ala Leu Asp Cys Met Glu Glu Lys Asn Gln
 115 120 125
 Ala Val Cys His Asp Tyr Asp Ile His Phe Tyr Pro Thr Phe Arg Tyr
 130 135 140
 Phe Lys Ala Phe Thr Lys Glu Phe Thr Thr Gly Glu Asn Phe Lys Gly
 145 150 155 160
 Pro Asp Arg Glu Leu Arg Thr Val Arg Gln Thr Met Ile Asp Phe Leu
 165 170 175
 Gln Asn His Thr Glu Gly Ser Arg Pro Pro Ala Cys Pro Arg Leu Asp
 180 185 190
 Pro Ile Gln Pro Ser Asp Val Leu Ser Leu Leu Asp Asn Arg Gly Ser
 195 200 205
 His Tyr Val Ala Ile Val Phe Glu Ser Asn Ser Ser Tyr Leu Gly Arg
 210 215 220
 Glu Val Ile Leu Asp Leu Ile Pro Tyr Glu Ser Ile Val Val Thr Arg
 225 230 235 240
 Ala Leu Asp Gly Asp Lys Ala Phe Leu Glu Lys Leu Gly Val Ser Ser
 245 250 255
 Val Pro Ser Cys Tyr Leu Ile Tyr Pro Asn Gly Ser His Gly Leu Ile
 260 265 270
 Asn Val Val Lys Pro Leu Arg Ala Phe Phe Ser Ser Tyr Leu Lys Ser
 275 280 285
 Leu Pro Asp Val Arg Lys Lys Ser Leu Pro Leu Pro Glu Lys Pro His
 290 295 300
 Lys Glu Glu Asn Ser Glu Ile Val Val Trp Arg Glu Phe Asp Lys Ser
 305 310 315 320
 Lys Leu Tyr Thr Val Asp Leu Glu Ser Gly Leu His Tyr Leu Leu Arg
 325 330 335
 Val Glu Leu Ala Ala His Lys Ser Leu Ala Gly Ala Glu Leu Lys Thr
 340 345 350
 Leu Lys Asp Phe Val Thr Val Leu Ala Lys Leu Phe Pro Gly Arg Pro
 355 360 365

Sequence Listing PatentIn-file BP202624.ST25 (ID 771711)

Pro Val Lys Lys Leu Leu Glu Met Leu Gln Glu Trp Leu Ala Ser Leu
370 375 380

Pro Leu Asp Arg Ile Pro Tyr Asn Ala Val Leu Asp Leu Val Asn Asn
385 390 395 400

Lys Met Arg Ile Ser Gly Ile Phe Leu Thr Asn His Ile Lys Trp Val
405 410 415

Gly Cys Gln Gly Ser Arg Ser Glu Leu Arg Gly Tyr Pro Cys Ser Leu
420 425 430

Trp Lys Leu Phe His Thr Leu Thr Val Glu Ala Ser Thr His Pro Asp
435 440 445

Ala Leu Val Gly Thr Gly Phe Glu Asp Asp Pro Gln Ala Val Leu Gln
450 455 460

Thr Met Arg Arg Tyr Val His Thr Phe Phe Gly Cys Lys Glu Cys Gly
465 470 475 480

Glu His Phe Glu Glu Met Ala Lys Glu Ser Met Asp Ser Val Lys Thr
485 490 495

Pro Asp Gln Ala Ile Leu Trp Leu Trp Lys Lys His Asn Met Val Asn
500 505 510

Gly Arg Leu Ala Gly His Leu Ser Glu Asp Pro Arg Phe Pro Lys Leu
515 520 525

Gln Trp Pro Thr Pro Asp Leu Cys Pro Ala Cys His Glu Glu Ile Lys
530 535 540

Gly Leu Ala Ser Trp Asp Glu Gly His Val Leu Thr Phe Leu Lys Gln
545 550 555 560

His Tyr Gly Arg Asp Asn Leu Leu Asp Thr Tyr Ser Ala Asp Gln Gly
565 570 575

Asp Ser Ser Glu Gly Gly Thr Leu Ala Arg Gly Glu Glu Glu Glu Lys
580 585 590

Arg Leu Thr Pro Pro Glu Val Ser His Gly Asp Arg Asp Thr Gln Ser
595 600 605

Val Arg Pro Pro Gly Ala Leu Gly Pro Arg Pro Ala Leu Pro Glu Ser
610 615 620

Leu His His Ser Leu Asp Gly Lys Leu Gln Ser Leu Asp Gly Pro Gly
625 630 635 640

Sequence Listing PatentIn-file BP202624.ST25 (ID 771711)

Ala His Lys Glu Val Gly Gly Ala Ala Pro Phe Leu Gly Val Asp Phe
645 650 655

Ser Ser Leu Asp Met Ser Leu Cys Val Val Leu Tyr Val Ala Ser Ser
660 665 670

Leu Phe Leu Met Val Met Tyr Phe Phe Phe Arg Val Arg Ser Arg Arg
675 680 685

Trp Lys Val Lys His His His Pro Ala Val
690 695

<210> 9
<211> 95
<212> PRT
<213> Vaccinia virus

<400> 9

Met Asn Pro Lys His Trp Gly Arg Ala Val Trp Thr Ile Ile Phe Ile
1 5 10 15

Val Leu Ser Gln Ala Gly Leu Asp Gly Asn Ile Glu Ala Cys Lys Arg
20 25 30

Lys Leu Tyr Thr Ile Val Ser Thr Leu Pro Cys Pro Ala Cys Arg Arg
35 40 45

His Ala Thr Ile Ala Ile Glu Asp Asn Asn Val Met Ser Ser Asp Asp
50 55 60

Leu Asn Tyr Ile Tyr Tyr Phe Phe Ile Arg Leu Phe Asn Asn Leu Ala
65 70 75 80

Ser Asp Pro Lys Tyr Ala Ile Asp Val Ser Lys Val Lys Pro Leu
85 90 95

<210> 10
<211> 236
<212> PRT
<213> Escherichia coli

<400> 10

Met Lys Lys Gly Phe Met Leu Phe Thr Leu Leu Ala Ala Phe Ser Gly
1 5 10 15

Phe Ala Gln Ala Asp Asp Ala Ala Ile Gln Gln Thr Leu Ala Lys Met
20 25 30

Gly Ile Lys Ser Ser Asp Ile Gln Pro Ala Pro Val Ala Gly Met Lys
35 40 45

Thr Val Leu Thr Asn Ser Gly Val Leu Tyr Ile Thr Asp Asp Gly Lys
Si vu 15

50

55

60

His Ile Ile Gln Gly Pro Met Tyr Asp Val Ser Gly Thr Ala Pro Val
65 70 75 80

Asn Val Thr Asn Lys Met Leu Leu Lys Gln Leu Asn Ala Leu Glu Lys
85 90 95

Glu Met Ile Val Tyr Lys Ala Pro Gln Glu Lys His Val Ile Thr Val
100 105 110

Phe Thr Asp Ile Thr Cys Gly Tyr Cys His Lys Leu His Glu Gln Met
115 120 125

Ala Asp Tyr Asn Ala Leu Gly Ile Thr Val Arg Tyr Leu Ala Phe Pro
130 135 140

Arg Gln Gly Leu Asp Ser Asp Ala Glu Lys Glu Met Lys Ala Ile Trp
145 150 155 160

Cys Ala Lys Asp Lys Asn Lys Ala Phe Asp Asp Val Met Ala Gly Lys
165 170 175

Ser Val Ala Pro Ala Ser Cys Asp Val Asp Ile Ala Asp His Tyr Ala
180 185 190

Leu Gly Val Gln Leu Gly Val Ser Gly Thr Pro Ala Val Val Leu Ser
195 200 205

Asn Gly Thr Leu Val Pro Gly Tyr Gln Pro Pro Lys Glu Met Lys Glu
210 215 220

Phe Leu Asp Glu His Gln Lys Met Thr Ser Gly Lys
225 230 235

<210> 11
<211> 508
<212> PRT
<213> Homo sapiens

<400> 11

Met Leu Arg Arg Ala Leu Leu Cys Leu Ala Val Ala Ala Leu Val Arg
1 5 10 15

Ala Asp Ala Pro Glu Glu Glu Asp His Val Leu Val Leu Arg Lys Ser
20 25 30

Asn Phe Ala Glu Ala Leu Ala Ala His Lys Tyr Leu Leu Val Glu Phe
35 40 45

Tyr Ala Pro Trp Cys Gly His Cys Lys Ala Leu Ala Pro Glu Tyr Ala
50 55 60

Sequence Listing PatentIn-file BP202624.ST25 (ID 771711)

Lys Ala Ala Gly Lys Leu Lys Ala Glu Gly Ser Glu Ile Arg Leu Ala
65 70 75 80

Lys Val Asp Ala Thr Glu Glu Ser Asp Leu Ala Gln Gln Tyr Gly Val
85 90 95

Arg Gly Tyr Pro Thr Ile Lys Phe Phe Arg Asn Gly Asp Thr Ala Ser
100 105 110

Pro Lys Glu Tyr Thr Ala Gly Arg Glu Ala Asp Asp Ile Val Asn Trp
115 120 125

Leu Lys Lys Arg Thr Gly Pro Ala Ala Thr Thr Leu Pro Asp Gly Ala
130 135 140

Ala Ala Glu Ser Leu Val Glu Ser Ser Glu Val Ala Val Ile Gly Phe
145 150 155 160

Phe Lys Asp Val Glu Ser Asp Ser Ala Lys Gln Phe Leu Gln Ala Ala
165 170 175

Glu Ala Ile Asp Asp Ile Pro Phe Gly Ile Thr Ser Asn Ser Asp Val
180 185 190

Phe Ser Lys Tyr Gln Leu Asp Lys Asp Gly Val Val Leu Phe Lys Lys
195 200 205

Phe Asp Glu Gly Arg Asn Asn Phe Glu Gly Glu Val Thr Lys Glu Asn
210 215 220

Leu Leu Asp Phe Ile Lys His Asn Gln Leu Pro Leu Val Ile Glu Phe
225 230 235 240

Thr Glu Gln Thr Ala Pro Lys Ile Phe Gly Gly Glu Ile Lys Thr His
245 250 255

Ile Leu Leu Phe Leu Pro Lys Ser Val Ser Asp Tyr Asp Gly Lys Leu
260 265 270

Ser Asn Phe Lys Thr Ala Ala Glu Ser Phe Lys Gly Lys Ile Leu Phe
275 280 285

Ile Phe Ile Asp Ser Asp His Thr Asp Asn Gln Arg Ile Leu Glu Phe
290 295 300

Phe Gly Leu Lys Lys Glu Glu Cys Pro Ala Val Arg Leu Ile Thr Leu
305 310 315 320

Glu Glu Glu Met Thr Lys Tyr Lys Pro Glu Ser Glu Glu Leu Thr Ala
325 330 335

Sequence Listing PatentIn-file BP202624.ST25 (ID 771711)

Glu Arg Ile Thr Glu Phe Cys His Arg Phe Leu Glu Gly Lys Ile Lys
 340 345 350
 Pro His Leu Met Ser Gln Glu Leu Pro Glu Asp Trp Asp Lys Gln Pro
 355 360 365
 Val Lys Val Leu Val Gly Lys Asn Phe Glu Asp Val Ala Phe Asp Glu
 370 375 380
 Lys Lys Asn Val Phe Val Glu Phe Tyr Ala Pro Trp Cys Gly His Cys
 385 390 395 400
 Lys Gln Leu Ala Pro Ile Trp Asp Lys Leu Gly Glu Thr Tyr Lys Asp
 405 410 415
 His Glu Asn Ile Val Ile Ala Lys Met Asp Ser Thr Ala Asn Glu Val
 420 425 430
 Glu Ala Val Lys Val His Ser Phe Pro Thr Leu Lys Phe Phe Pro Ala
 435 440 445
 Ser Ala Asp Arg Thr Val Ile Asp Tyr Asn Gly Glu Arg Thr Leu Asp
 450 455 460
 Gly Phe Lys Lys Phe Leu Glu Ser Gly Gly Gln Asp Gly Ala Gly Asp
 465 470 475 480
 Asp Asp Asp Leu Glu Asp Leu Glu Glu Ala Glu Glu Pro Asp Met Glu
 485 490 495
 Glu Asp Asp Asp Gln Lys Ala Val Lys Asp Glu Leu
 500 505